Anemia of Chronic Renal Failure

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CPT McMillan: Renal Rotation

March 2001

Definition

- Normochromic, normocytic anemia
- Too few red blood cells
- Seen in chronic renal failure

- > 90% of dialysis patients will become anemic

Pathophysiology

- Decreased erythropoeitin production
  - Decreased renal function
- Reduced red blood cell survival
  - 64 day lifespan
- Bone marrow suppression
  - Uremic environment

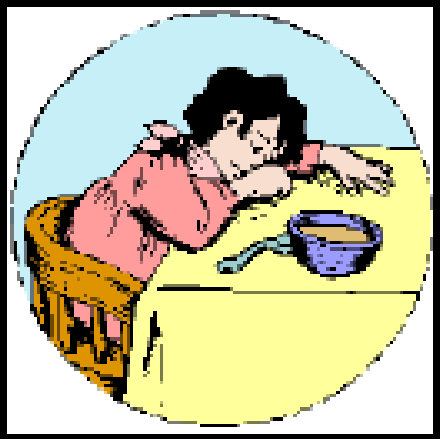
Pathophysiology

Secondary to:

- Iron deficiency
- Drug effects
- Occult bleeding

Symptoms

- Fatigue
- Loss of appetite



Management

- Epogen (erythroeitin)
- Iron supplement

- Monitor lab values frequently to determine course of treatment

Management

Goal:

Hematocrit 33-36%

- Less than 33% = anemia
- Greater than 36% = viscous blood, difficult circulation

- Hematocrit dependent on iron status

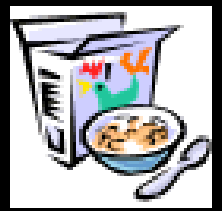
Iron Status

Panel:

- Serum Iron – amount of Fe circulating
- TIBC – measure of transferrin binding ability
- TSAT – ratio of iron bound to transferrin
- Ferritin – amount of iron in storage

Oral Iron

- Optimal choice over IV iron
- Food
  - Ferrous form
  - Heme iron
  - Recommend red meat and iron fortified foods



Oral Iron

- Medication supplement
  - Ferrous sulfate (20% elemental Fe)
  - Poor patient compliance
    - Timing
    - GI upset
    - Constipation
  - Inadequate intestinal absorption
    - Phosphate binders

IV Iron

Iron Dextran

- Similar in structure to ferritin
- Slow release of iron
- Serum ferritin levels rise within 2 weeks
  - Must wait 2 weeks after dose to repeat iron studies

Erythropoeitin (Epogen)

- Initiate when Hct <30% and iron replete
- Manufactured by recombinant DNA
- Stimulates proliferation & differentiation of baby red blood cells in bone marrow

Erythropoeitin (Epogen)

IV

- Quickly dispersed
- Rapid clearance
- Greater amount necessary

Subcutaneous

- Preferred method
- Sustained release from tissue
- 15-50% reduced dose ($$)

Management Goals

- Hematocrit 33-36%
  - Epogen
- Prevent iron depletion
  - Iron replacement
- Cost effectiveness and safety

Patient

- Black, 46 yo, male
- ESRD, hemodialysis

- Chronic renal failure care plan

Medical History

- 1984 car accident => hip pain
- 1984-1994 heavy pain killer use
- 1994 L hip replacement w/ blood transfusion => Hep C

Medical History

- Analgesic nephropathy developed
- March 2000 initiate dialysis
- January 2001 R hip replacement
- April 2001 kidney transplant scheduled

Psychosocial Issues

- Married
- Lives at home
- Smokes 2 cigarettes / day
- No alcohol use
- Compliance to Tx “as best as can”

Anthropometrics

- Ht: 65”
- Dry wt: 68.5 kg
- UBW: 74 kg
- DBW: 63-69 kg
  - Medium frame
- %UBW 93%
- %DBW 100%

Diet history

- 3 meals & 2 snacks on HD days
- 2 meals & 2 snacks on non-HD days

- Likes meat
- Limits Na
- Limits K
- Adjusts fluid intake to urine output

Estimated Nutrient Needs

Calories: 2000-2400 kcal (30-35 kcal/kg)

Protein: 82-96 g (1.2-1.4 g/kg)

Potassium: 2740 mg (40 mg/kg)

Phosphorus: <685 mg/d

Sodium: 2 g

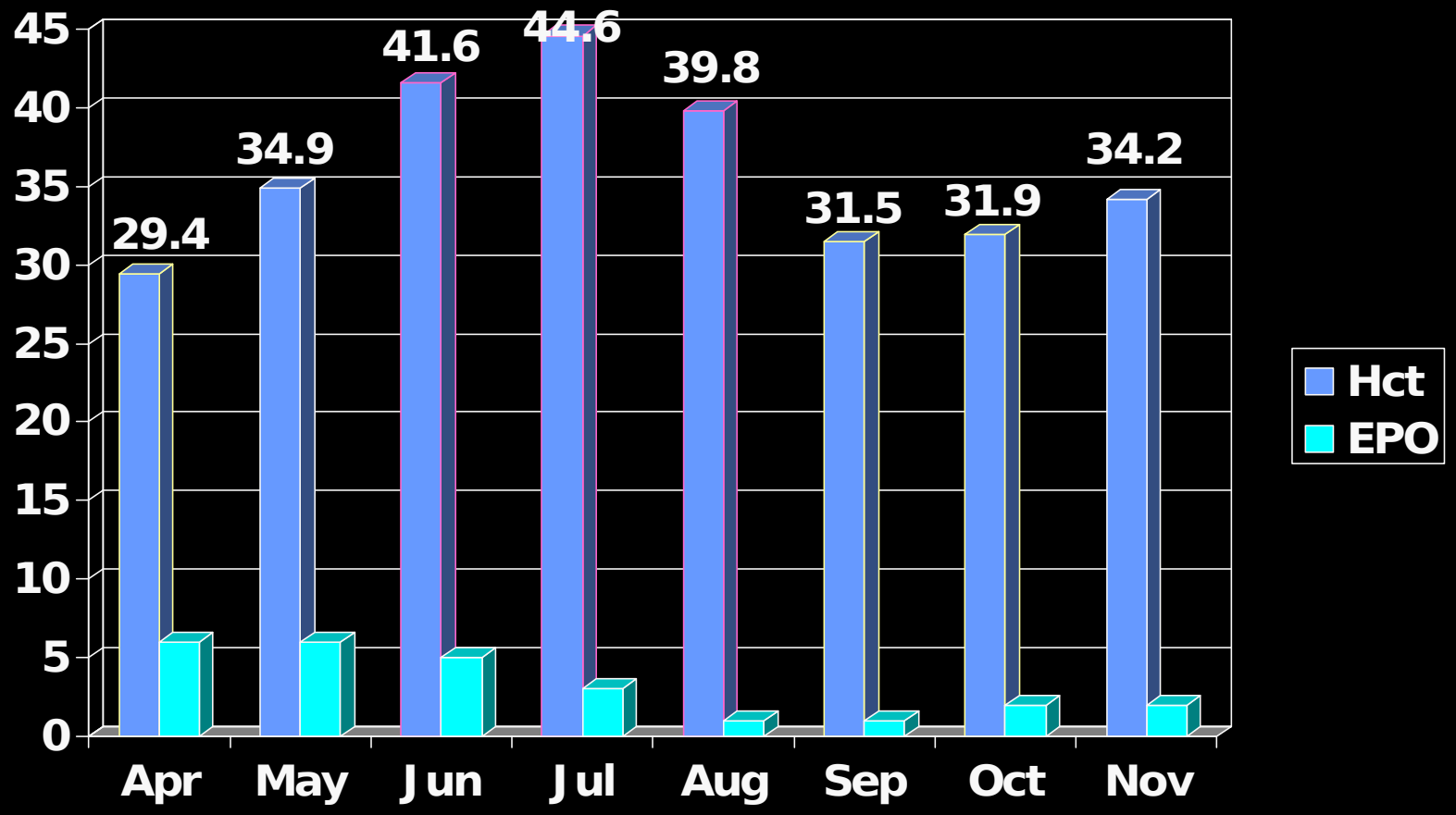
Medications

- Oscal –500
- Rocaltrol
- Nephrocap
- Adalat
- Lopressor
- Colace

Labs

	Value (12 Feb)	Normal
Albumin	4.0	3.5-5.0
Iron	133	48-182
TIBC	358	250-450
TSAT	37 %	20-50
Ferritin	658.5	100-800 (30-400)
Hct	34 %	33-36 (42-52)

Anemia Management



Nutrition Diagnostic Statement

Pt is 100% DBW, so meets ht/wt stds for potential transplant. All nutritionally significant labs wnl, to include albumin of 4.0. Iron panel wnl, to include 37% TSAT and 34% Hct. Average IDWG less than 3 kg.

Recommendation

- Maintain consistent oral intake

Goal

- To maintain DBW and all labs wnl

Questions?